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# CLEAN WATER REPORTER

# Plan to Reduce Costs of City's Sewer Project

## Rescheduling Proposed For Construction of City's Sewage System

A major effort to reduce the costs of San Francisco's Clean Water Program is well-underway.

Inflation pushed the expected cost of the program to end the City's pollution of the bay and ocean by 1986 to more than $2.3 billion. Earlier estimates had pegged the cost of new facilities at $1.9 billion. Concerns about the availability of money from the State and Federal governments, which are paying more than 80 percent of the costs, as well as local funding capacity, led Chief Administrative Officer Roger Boas to order a staff re-evaluation of the Wastewater Master Plan. This had been approved in 1974, after extensive public hearings by the City and by State and Federal environmental regulatory agencies.

### Will Build in Stages

"The solution appears to be a three-stage schedule that will prevent construction of any white elephants–facilities that wouldn't be useful if the entire system couldn't be finished because of a dollar shortfall in future years," Boas said.

"We'll be taking this proposal to the regulatory agencies for approval soon," Boas added.

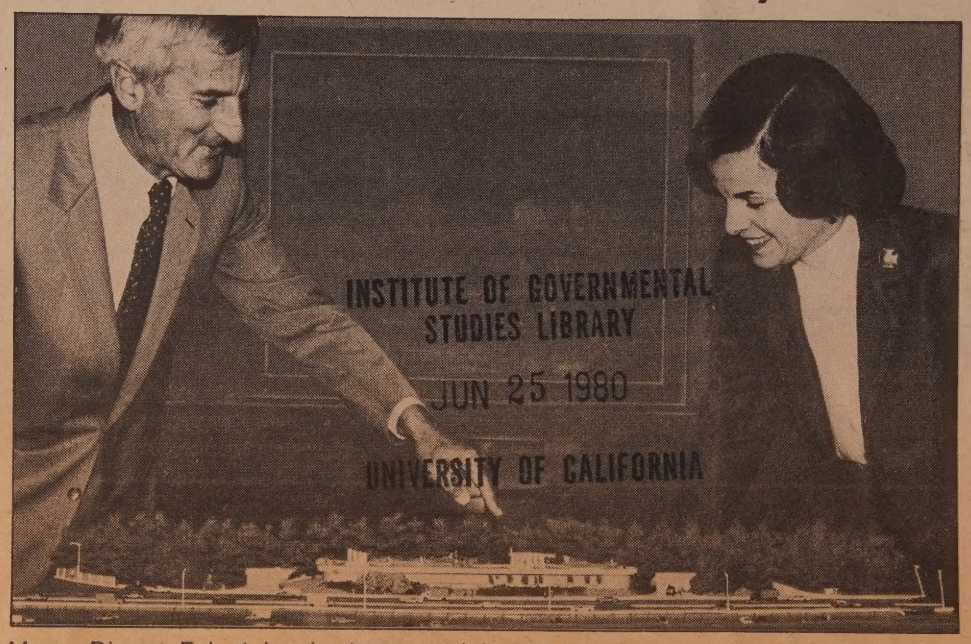
The proposed schedule calls for early completion of all sewer construction now underway along the Northeastern section of the Bayside of the City, plus the completion of secondary treatment at the Southeast Plant–$410 million in improvements.

The next effort would see construction by 1985 of most plan components (see map, page 2), bringing expenditures to $1.6 billion. This represents the limit of the City's current funding capacity, assuming a 15 percent share of the project costs and a 15 percent inflation rate.

"At this point, we would be meeting about 90 percent of our environmental goals," Boas said.

Once sufficient local, State and Federal funding was secured, all of the originally discussed components would be completed. Cost of this is estimated to be an additional $700 million.

Boas stressed that with completion of the $1.6 billion effort, all sewage, plus the rainwater runoff that is captured, will be treated. Completion of the final components would eliminate bay discharge of sewage effluent.




Mayor Dianne Feinstein, viewing a model of the planned Southwest Pump Station with Chief Administrative Officer Roger Boas, has long been an advocate for the City's plan to stop discharge of untreated sewage into the bay and ocean. Boas has overall supervision of the program, which is managed by the Director of Public Works.

The new construction schedule will require approval by the Regional Water Quality Control Board, State Water Resources Control Board, and the U.S. Environmental Protection Agency.

Boas said the City will make its best efforts to secure these approvals.

*Required, Necessary, Costly*

## San Francisco's Wastewater Program

by Roger Boas,
Chief Administrative Officer

During February, when the Bay Area was hit by heavy storms, the City of San Francisco dumped millions of gallons of untreated sewage into the bay.

But this was not unusual. It happens an average of 80 times each year when storm runoffs inundate our sewer treatment plants. The volume of rainwater pouring into our sewers and mixing with our normal wastes is simply too much for the City's treatment plants to handle. The gates are opened at 39 separate outfalls and everything flows raw into the bay and ocean. Beaches are closed an average of 120 days a year because of this.

San Francisco's sewer system dates from the 1890's. Citizens of that period, and for many years afterward, saw no need to treat sewage, and no need for a separate system to carry off excessive rainwater. It wasn't a bad way to do it. Then, and now, the rains flush our sewers clean.

As time went on, and it became apparent that all the cities around the bay were not only destroying the ecology of this great body of water but creating a severe health hazard by flooding it with sewage, treatment plants were built. However, they generally provided only primary treatment which removes about half the solids. In San Francisco's case, the plants can't even do that when the rains fall.

With passage of the Federal Water Control Act in 1972, and with the creation of State and regional Water Quality Control Boards, both State and Federal agencies set standards for sewage treatment. Basic among these is that any sewage discharged into the bay must be treated to secondary level. This results in effluent that is about 90 percent clean.

For each day San Francisco violates the standards, the City may be fined from $10,000 to $55,000. Also, the State can impose a ban on new sewer hook-ups, effectively stopping all new construction in the City.

Progress is being made. The State and Federal governments are contributing more than 80 percent of the costs. The City's share is being met by a sewer service charge, added to industrial, commercial and residential water bills.

The Wastewater Program was imposed upon the City. Yet, in good conscience as Bay Area citizens, we could not continue to be polluters. The program is very costly. However, we are moving ahead, as we must, maintaining tight control on expenditures, and looking forward to the day when the "Danger-Pollution" signs need never again be posted on our bay or ocean shores.

(Excerpted from an article published March 13, 1980, in the San Francisco Examiner.)

## Environmental Agencies' Approvals Necessary To Proceed with Plan

In order to proceed with Clean Water Program construction as it has been rescheduled, the City must obtain the approvals of the State Regional Water Quality Control Board, State Water Resources Control Board and the Federal Environmental Protection Agency.

These agencies previously approved the Program Master Plan which the City presented after endorsement by the Board of Supervisors. However, funding uncertainties at the Federal, State and City levels have made necessary a reevaluation of the Plan's priorities, in order to assure that all of the major elements can be completed within the monies available.

The revised schedule calls for approximately *$1.6 billion of immediate construction*, versus a $2.3 billion budget for the completed Master Plan. With the work to be done under the lower budget, all sewage will be treated before discharge into the bay or ocean. Under the Master Plan, there would be discharge into the ocean only, and the treatment and transport capacity to accomplish this would be built in the future when funds are available.

Modification of the original schedule will be the subject of a careful review by the environmental agencies.

## VOTERS AGAIN SHOW THEIR SUPPORT FOR CLEAN WATER PROGRAM

The people of San Francisco have once again affirmed in the voting booth that they want to stop the discharge of untreated or insufficiently treated sewage into the bay and ocean waters that surround them.

In 1976, voters gave a strong mandate to the clean water program by approving the issuance of $240 million in bonds to pay for construction of a modern system of sewage treatment. A year before they had approved allocating Zoo property for a major new treatment plant.

Then, in this past election, voters gave a strong vote of confidence to the environmental program by rejecting Proposition T. Passage would have stopped everything in mid-stream by halting sale of the previously authorized bonds to pay San Francisco's share of the project.

Under this mandate of the electorate, work will move ahead rapidly to meet the water quality and public health requirements of regulatory agencies within the funding resources available.

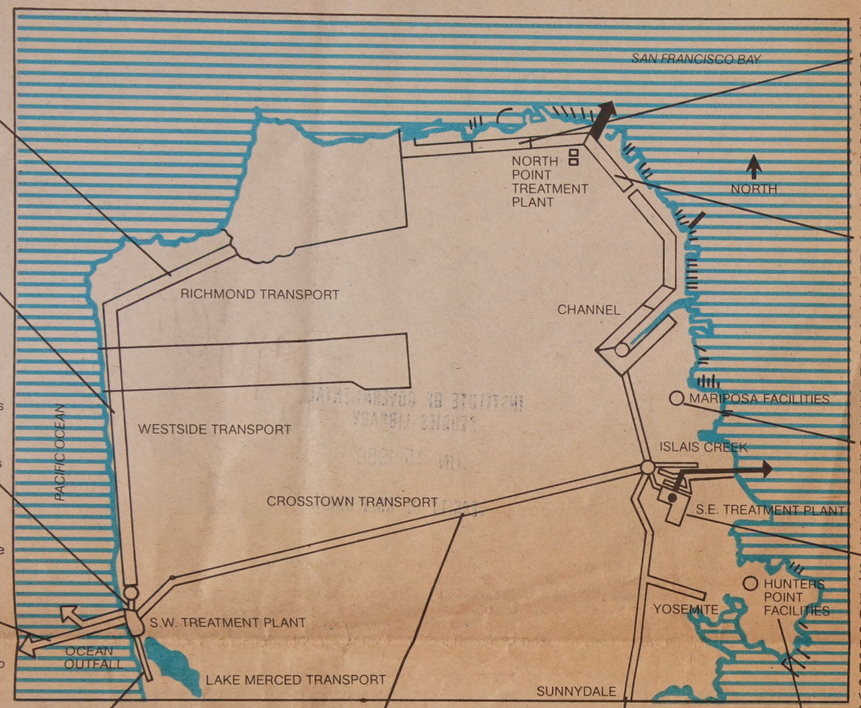
# Clean Water Construction Program

**Richmond Transport**
This sewer connects with the Westside Transport. By collecting sewage and rainwater runoff in this area, it will reduce overflows into the ocean.

**Westside Transport**
This 2½ mile long artery, actually a large box sewer, will carry sewage and rainwater runoff from the City's Westside to a pump station that will discharge to the Southwest Plant. It will run parallel to Ocean Beach beneath the Great Highway.

**Southwest Treatment Plant**
Nearly 20% of the City's sewage will be treated at this plant–handling the City's Westside and some excess flows from the Bayside. Assuming the City's ocean waiver is approved, primary treatment, removing about half the pollutants, will be provided.

**Ocean Outfall**
Treated sewage will be carried more than *four miles offshore* into water 75 feet deep when this structure is completed in 1985, eliminating all dry weather discharges to the bay.




**Lake Merced Transport**
This facility will greatly reduce sewage overflows along the southwest edge of the City. Sewage and rainwater runoff will be stored briefly in it prior to treatment.

**Crosstown Transport**
Approximately 10 feet in diameter, this transport will be placed up to 300 feet beneath the City to carry effluent during dry weather to the Ocean Outfall in its initial phase.

**Sunnydale-Yosemite Transport**
Reducing sewage overflows into the Sunnydale and Yosemite basins to an average of one per year is the goal here. Construction will begin in late 1982.

**Hunter's Point Facilities**
This sewer, to be built by the end of 1984, will reduce the number of overflows into India Basin. Sewage will be stored briefly, and then diverted to the Southeast Plant for treatment.

**Northeast Transport**
This large conduit, which extends from the Presidio to the Southeast Plant, will collect and transport sewage and rainwater from the Northeastern sector of the City. All construction is underway and will be completed by the winter of 1982.

**North Point Treatment Plant**
While it now provides primary treatment to between 20 and 30% of the City's sewage, the North Point Treatment Plant would operate only during rainy weather under the new staged program.

**Mariposa Facilities**
These will reduce overflows of diluted raw sewage into the Mariposa Basin, where there is boating and other recreational activity. Sewage will be collected and pumped to the Southeast Plant.

**Southeast Treatment Plant**
Upon completion of its expansion in 1982, this plant will treat about 80% of the City's sewage. During dry weather, all effluent from this plant will be pumped via the Crosstown Transport for discharge through the Ocean Outfall.

# Plan Calls for Treatment of All Sewage and Runoff

Under the new proposal for staged construction of the Wastewater Master Plan, all of the City's sewage would be treated and discharged into the ocean in dry weather after 1985. During heavy rain periods, all sewage and rainwater runoff would be treated, with minor permitted exceptions. Some would be discharged into the bay until the entire program was completed in 1988.

In dry weather, the expanded Southeast Treatment Plant will provide secondary treatment (90 percent of pollutants removed) to sewage generated in the eastern half of the City. After treatment, the effluent would be pumped through the Crosstown Transport to a new Southwest Treatment Plant on the ocean near San Francisco Zoo.

The Southwest Plant would provide primary treatment to sewage generated in the western half of the City (half of pollutants removed).

The effluent from the two plants will be mixed at the ocean outfall and transported by pipeline some four miles into the ocean for discharge. The mixture will be at a treatment level better than primary but less than secondary. Dispersion into the ocean is expected to cause no environmental problems.

During wet weather, the present Northpoint Treatment Plant will be activated when it rains, providing primary treatment to rainwater and sewage for discharge into the bay.

The Southeast Treatment Plant will provide primary and secondary treatment to sewage and rainwater. Most of the secondary effluent will go into the bay. The primary effluent, mixed with some secondary effluent and rainwater, will be pumped through the Crosstown Transport for ocean discharge.

At the Southwest Treatment Plant, during storms, sewage and rainwater from the western half of the City will be treated to primary level. This will be mixed with the treated effluent from the Southwest Plant for discharge into the ocean through the outfall.

This program is the result of staging the construction plans to keep costs within the presently known funding capabilities of State and Federal governments and the City.

It is desirable that all sewage, in both wet and dry weather, be treated for discharge far out into the ocean, and this remains the intent of the Wastewater Program. However, to achieve this goal it will be necessary to spend approximately $700 million more than is required to provide the $1.6 billion system depicted above.

Other elements to be completed under the staged construction program are the large sewage transports around the City. These not only transport the sewage and rainwater to the treatment plants but act as linear holding tanks, keeping the plants from being inundated during storms. The sewage and runoff waters can be released into the plants at volumes the processing system can handle.

Under construction now are the Northeast Transport and the expanded Southeast Treatment Plant.

Construction of the remainder of the system depicted in the map will be undertaken in a staged manner, with work on various elements proceeding together.

* * *

San Francisco has about 24 miles of shoreline, with 8.5 miles on the ocean and 15.5 miles on the bay.

* * *

Rainstorms over the City tend to have a long duration. Of the 55 storms occurring in the average year, half are six hours or longer; 10 are 17 hours or longer; and five are 24 hours or longer.



## Westside Transport Key Program Element

On the western side of the City, when the rains hit San Francisco, diluted raw sewage now runs freely into the ocean an average of 114 times a year. The Richmond-Sunset Sewage Treatment Plant, which serves most of this area of the City, simply cannot handle the added loads.

The Westside Transport and Storage Facility, coupled with a new Southwest Treatment Plant and Ocean Outfall, will correct this highly undesirable condition.

The Westside Transport will capture rainwater and sewage flows and store them briefly for processing at the Southwest Treatment Plant.

The main Transport will extend from Fulton Street to south of Sloat Boulevard, approximately two-and-a-half miles. Its inside diameter will be 25 feet wide, increasing to 50 feet for short distances at two points. Its depth will range from 12 feet at the northern end to 48 feet at the southern end, and it will rest entirely under a new Upper Great Highway to be re-built as part of the program.

A pump station, located at the southern end of the transport, will lift the accumulated sewage flows and feed them into the Southwest Treatment Plant.

The pump station will be landscaped, and a large public viewing area on its roof will provide sweeping coastal vistas.

There are two related transports on the westside. The Richmond Transport will carry the sewage and runoff generated on the entire upper westside of the City for treatment at the Southwest Plant. A Lake Merced Transport will capture sewage and runoff from the extreme southwestern part of the City.

## IMPROVEMENTS TO GREAT HIGHWAY

During much of the year, the Great Highway is awash with sand and traffic is prohibited. The Westside Transport will be built beneath the present highway, which will be vastly improved. While the roadway will be made narrower, extensive landscaping will be added and there will be an equestrian trail, a hiking and jogging path, and a bicycle path. The dune field will be expanded with sand from construction of the Westside Transport, and regrading and planting will minimize blowing sand. Pedestrian underpasses will be added for improved beach access. A long range plan for sand replenishment and landscape maintenance is an *important part of the program.*

## Southwest Plant Plays Major Role in Treatment Plan

The Southwest Wastewater Treatment Plant will be an entirely new facility, designed to provide primary treatment to all sewage and runoff entering the system from the western half of the City. It will also treat a substantial part of the wet weather excess from the eastern half of San Francisco.

Located on 42 acres adjacent to the Zoo and Lake Merced, most of the large plant will be built underground. The surface area will be carefully landscaped and is expected to be used for recreational purposes or expansion of the Zoo.

The plant will have a treatment capacity of up to 130 million gallons of sewage and rain runoff a day, removing half or more of all pollutants before discharge through the Ocean Outfall nearby.

During dry weather, the plant will treat to primary level the sewage generated in the western half of the City. This will be mixed with effluent treated to secondary level at the Southeast Plant and arriving by the Crosstown Transport. The combined effluent will then be discharged in the ocean.

At present, westside sewage is treated by the small Richmond-Sunset Plant in Golden Gate Park. Once the Southwest Plant and connecting facilities are built and in operation the plant will be removed and the land returned to recreational use.

* * *

San Francisco has approximately 870 miles of combined sewers whose ages date *to the 1890s. Over one-third of the sewers* are 70 years old or older.

## Ocean Outfall to Take Effluent Out to Sea

The Ocean Outfall, an important element in the City's Clean Water Program, will transport and discharge into 75 feet of seawater all effluent from San Francisco's sewage treatment plants generated during dry weather. Ultimately, it is planned for all wet weather discharges to be made into the ocean as well.

Essentially, the Outfall will consist of an onshore headworks built underground near a new Southwest Treatment Plant. Two large concrete pipes will extend out beneath the ocean floor, and a series of diffusers near their ends will disperse the effluent into the ocean.

**Large Diameter Pipes**

The buried headworks will be a concrete box, 30 feet deep, 80 feet wide, and 160 feet long. Each of the pipes into which effluent will flow from the headworks will be nine feet in diameter. One of them, to be used only for the high flow rates during wet weather, will extend into the ocean for two miles. It will carry treated effluent produced from a combination of rain runoff and sewage from homes and businesses. The second pipe will be more than four miles long and will be used during dry weather. It will carry effluent produced only from the treated sewage coming from homes and businesses.

The pipes will be buried beneath the ocean floor, and about one mile out, the Outfall will cross the San Andreas Fault. Special joints in the pipes will allow them to move during an earthquake.

## Minimizing Impacts To Neighborhoods

The San Francisco Clean Water Program is vitally concerned about the temporary impacts of its construction programs in the neighborhoods and will work closely with homeowner and merchant groups, as well as individual citizens, to minimize problems. These efforts are to be greatly expanded as more work gets underway.

A special staff will be assigned to respond quickly to citizen complaints about any phase of construction and work with contractors to develop prompt solutions.

Prior to the start of any construction public meetings will be held to explain the project and to receive citizen comments.

The major public concerns about construction have centered on noise, traffic routings for private vehicles, construction vehicle routes and public safety.

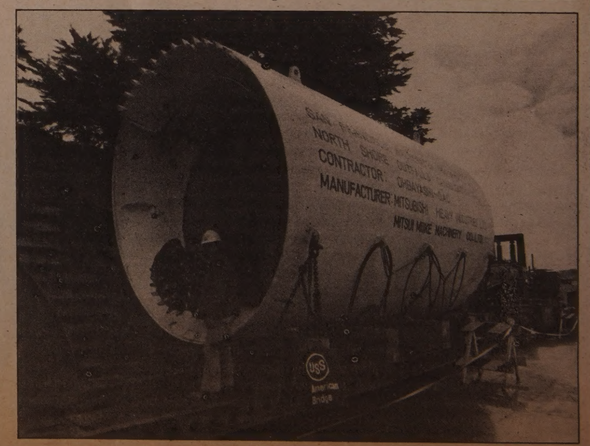
To reduce construction sounds, all equipment must meet government standards limiting noise output. Construction is limited to the hours between 7 a.m. and 6 p.m., except for special circumstances lasting for short periods.

Traffic impacts are reduced by working with the neighborhoods and the City's traffic department to develop convenient traffic rerouting which avoids conflicts between construction equipment and private vehicles.

Before trucks hauling dirt and debris leave work sites, they are inspected to assure materials will not litter the roadways. Trucks are limited to city-approved routes, usually main streets.

## TUNNELING BENEATH THE CITY

The Crosstown Transport, which will connect the eastside sewage collection and treatment facilities with those on the ocean, will be tunneled as deep as 300 feet as it crosses the City. Tunnel boring machines, such as the one pictured above, are already being used in building the Northshore Transport. With tunneling, there is virtually no evidence of the work going on below, except at access shafts and portals, where there will be some noise, truck traffic and storage areas. Sites for these areas will be selected following a series of public meetings. The Crosstown Transport will be approximately 10 feet in diameter and will carry effluent from the Southeast Plant for discharge into the ocean during dry weather. During wet weather it may transport mixed rainwater and raw sewage for treatment at the Westside Plant. In areas where the Transport must be near the surface, cut and cover construction will be kept to a minimum. The exact alignment will be selected after the public hearings.



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# SOUTHEAST PLANT BEING EXPANDED SEWAGE TREATMENT TO BE UPGRADED

When San Francisco's Wastewater Program is complete, all sewage will be treated at two plants. A new Southwest Plant near the Zoo will handle sewage from the western part of the City. The Southeast Plant in the Hunter's Point-Bayview District, now being expanded, will handle the sewage from the eastern half of the City.

Currently, the City's treatment plants, including the present Southeast Plant, provide only primary treatment to sewage before pumping it into the bay or ocean. This removes roughly 50 percent of the pollutants. When the expanded plant is complete, secondary treatment will be provided. This removes some 90 percent of the pollutants. Discharge of effluent into open water after secondary sewage treatment has a much less impact on the environment than discharge with only primary treatment.

During dry weather the Southeast Plant will handle sewage at a maximum rate of 140 million gallons a day. During wet weather, sewage and storm run-off will flow into the Plant at the same maximum rate, but under the Master Plan an excess of up to 460 million gallons per day could be diverted across the City through the Crosstown Transport. All flow will have been treated and then discharged into the ocean. Also, during storms, it will be necessary to discharge up to 200 million gallons per day of combined primary and secondary treated sewage into the bay.

A Southeast Community Center is being planned adjacent to this site as a mitigation measure. A proposal for what it should contain will be presented to the Board of Supervisors and the State Water Resources Control Board this summer for approval.

## Funding for the Clean Water Program

More than 80 percent of the currently projected $1.6 billion cost of the Clean Water Program is being provided by the State and Federal governments. Of the total amount, the City will pay $258 million, the State $192 million, and the Federal Government $1.15 billion.

The City's share of construction expense is being met through the sale of sewer revenue bonds and the proceeds from previous general obligation bonds–about $300 million total. Payment on this debt accounts for about one-third of the sewer service charge; the rest is used to maintain, operate and renew the system.

The sewer charge is billed every other month for most residences and monthly for business and industry. A customer's bill is based on how much water is used and sent to the sewer and the amount of treatment required. Sewage generated by industrial and commercial users generally carries more pollutants than residential sewage. Also, there are costs for treating rainwater runoff, and these are borne by everyone.

Using 150 gallons of water daily would lead to a $10.65 charge every two months, the average for all residential accounts. Apartment dwellers tend to use less water and pay a lower monthly charge. Homeowners typically use more water and therefore pay more. Customers who use 75 gallons a day or less have the lowest rate, called a "lifeline" rate.

Homeowners who use outside water for gardening and the like, can have their sewer charge adjusted through an appeal process.

In July the Board of Supervisors will hear a request to increase the rate, reflecting the sale of additional bonds. Public information meetings will be held throughout the City in conjunction with the Board's public hearings.

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Most of San Francisco's water supply comes from reservoirs in the Sierra Nevada range via an aqueduct system.

* * *

The longest rainstorm ever recorded in San Francisco dropped 5.5 inches of rain on the City over 133 hours in mid-January, 1952.

## The Levels of Sewage Treatment

There are three major levels of sewage treatment: Primary, Secondary, and Tertiary.

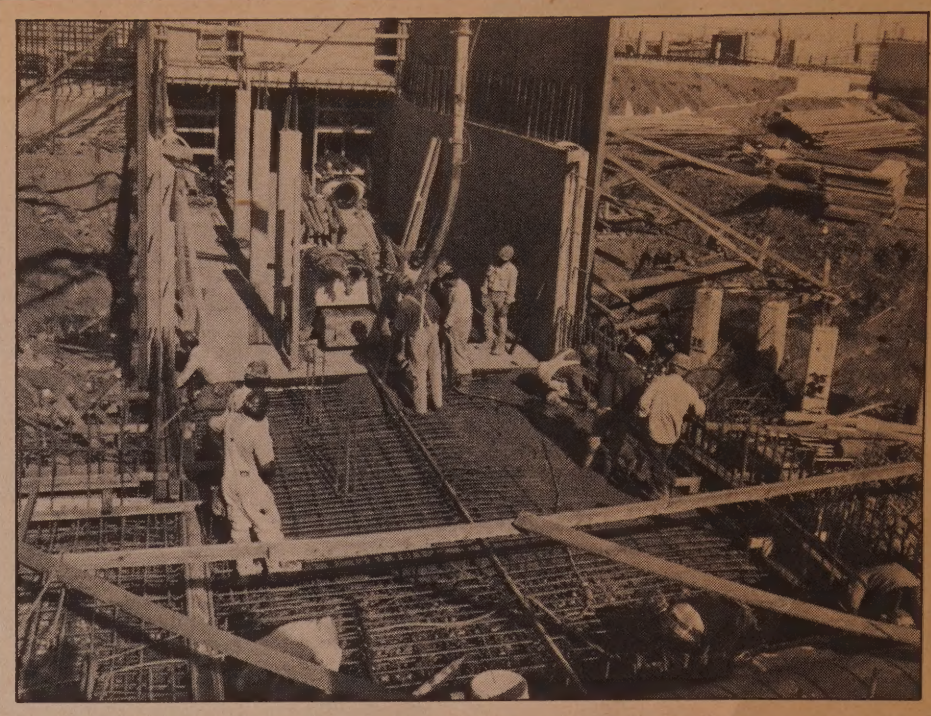
**Primary Treatment** removes about half the pollutants from sewage. Primary treatment alone can protect the environment and avoid health hazards, as well as meet California Ocean Plan requirements, if effluent is piped sufficiently far into the ocean.

**Secondary Treatment** eliminates about 90 percent of pollutants. Secondary treatment is acceptable for regular discharge of effluent into waters such as those in San Francisco Bay.

**Tertiary Treatment** results in an effluent that is essentially clear water. In extremely sensitive areas, such as at Lake Tahoe, tertiary treatment is necessary.

**Briefing for Supervisors**

A briefing on the plan to construct the City's sewage management facilities on a staged basis is given by Chief Administrative Officer Roger Boas to (l-r) Supervisors Ella Hill Hutch, Donald Horanzy, Doris Ward and Carol Ruth Silver.



# PROGRAM CREATES MANY JOBS

Some 800 construction workers, more than half of them minorities, are now on the job for the Clean Water Program. Consistent with its affirmative action goals, the Program is providing jobs for minorities who are carpenters, electricians, cement masons, other skilled workers and laborers. On the Southeast Treatment Plant expansion minorities comprise more than 60 percent of the construction workforce. Some 35 percent of them are residents of the surrounding Bayview-Hunters Point District. The goal is to have at least half of all minorities working on this plant be residents of the neighborhood. Minority contractors are also playing a key role in the Wastewater Program. In 1979 they received 17.5 percent of construction money awarded for a total of $4.4 million.

## PUBLIC PARTICIPATION IN PROGRAM PLANNING

The San Francisco public has already played an important part in planning the Clean Water Program. An active Citizen Advisory Committee provides regular commentary on project proposals. Numerous public hearings and informational meetings have been held in the past and more are being scheduled for future months. These will be held in neighborhoods where construction is planned, as well as in central locations accessible to all residents. Representatives of the Public Affairs staff are prepared to meet during evening hours with neighborhood groups, and requests for information are solicited from interested individuals.

A call to the Public Affairs Department, 431-9430, will bring a prompt response.

### It's Now Called The Clean Water Program

San Francisco's sewage management effort has long been called the Wastewater Program. Now, to more accurately reflect the goals of the activity, the name is being changed to The San Francisco Clean Water Program.

That's the purpose of the effort–to keep the waters around the City clean by stopping the discharge of raw sewage.

The Clean Water Program is designed to meet both the health and environmental goals of the City, State and Federal Governments.

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